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Report of the individual review of the annual submission of Iceland submitted in 2013*

* In the symbol for this document, 2013 refers to the year in which the inventory was submitted, and not to the year of publication.

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I. Introduction and summary

1. This report covers the review of the 2013 annual submission of Iceland, coordinated by the UNFCCC secretariat, in accordance with decision 22/CMP.1. The review took place from 9 to 14 September 2013 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalists – Ms. Anke Herold (Germany) and Mr. Tinus Pulles (Netherlands); energy – Mr. Ali Can (Turkey), Ms. Rianne Dröge (Netherlands), Mr. Takashi Morimoto (Japan) and Mr. Ioannis Sempos (Greece); industrial processes and solvent and other product use – Mr. Kakhaberi Mdivani (Georgia), Ms. Emilija Poposka (the former Yugoslav Republic of Macedonia) and Mr. Koen Smekens (Belgium); agriculture – Mr. Amnat Chidthaisong (Thailand) and Mr. Steen Gyldenkærne (Denmark); land use, land-use change and forestry (LULUCF) – Mr. Kumeh Assaf (Liberia), Mr. Valentin Bellassen (France) and Mr. Matthew Searson (Australia); and waste – Mr. Gabor Kis-Kovacs (Hungary) and Ms. Sirintornthep Towprayoon (Thailand). Mr. Smekens and Ms. Towprayoon were the lead reviewers. The review was coordinated by Ms. Lisa Hanle (UNFCCC secretariat).

2. In accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1) (hereinafter referred to as the Article 8 review guidelines), a draft version of this report was communicated to the Government of Iceland, which provided comments that were considered and incorporated, as appropriate, into this final version of the report. All encouragements and recommendations in this report are for the next annual submissi[illegible]ness otherwise specified.

3. In 2011, the n[illegible] greenhouse gas (GHG) in Iceland was carbon dioxide (CO_2), accounting for 74.7 per [illegible]t of total GHG emissions[1] expressed in CO_2 equivalent (CO_2 eq), followed by methane (CH_4) (11.0 per cent) and nitrous oxide (N_2O) (10.1 per cent). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) collectively accounted for 4.2 per cent of the overall GHG emissions in the country. The industrial processes sector accounted for 40.3 per cent of total GHG emissions, followed by the energy sector (39.7 per cent), the agriculture sector (15.4 per cent), the waste sector (4.4 per cent) and the solvent and other product use sector (0.1 per cent). Total GHG emissions amounted to 4,460.03 Gg CO_2 eq and increased by 25.4 per cent between the base year[2] and 2011. The expert review team (ERT) concludes that the description in the national inventory report (NIR) of the trends for the different gases and sectors is reasonable.

4. Tables 1 and 2 show GHG emissions from sources included in Annex A to the Kyoto Protocol (hereinafter referred to as Annex A sources), emissions and removals from the LULUCF sector under the Convention and emissions and removals from activities under Article 3, paragraph 3, and, if any, elected activities under Article 3, paragraph 4, of the Kyoto Protocol (KP-LULUCF), by gas and by sector and activity, respectively. In table 1, CO_2, CH_4 and N_2O emissions included in the rows under Annex A sources do not include emissions and removals from the LULUCF sector.

5. Additional background data on recalculations by Iceland in the 2013 annual submission, as well as information to be included in the compilation and accounting database, can be found in annex I to this report.

[1] In this report, the term "total GHG emissions" refer to the aggregated national GHG emissions expressed in terms of CO_2 eq excluding LULUCF, unless otherwise specified.

[2] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The base year emissions include emissions from Annex A sources only.

Table 1

Greenhouse gas emissions from Annex A sources and emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, by gas, base year[a] to 2011

			Gg CO_2 eq								*Change (%)*
		Greenhouse gas	*Base year[a]*	*1990*	*1995*	*2000*	*2008*	*2009*	*2010*	*2011*	*Base year–2011*
Annex A sources		CO_2	2 160.11	2 160.11	2 318.22	2 775.92	3 605.13	3 571.84	3 431.81	3 332.75	54.3
		CH_4	453.71	453.71	471.82	485.58	509.05	506.56	506.37	491.12	8.2
		N_2O	520.90	520.90	477.42	495.07	504.19	469.28	453.68	448.45	-13.9
		HFCs	NA,NE,NO	NA,NE,NO	8.51	35.78	70.64	95.01	122.54	121.35	NA
		PFCs	419.63	419.63	58.84	127.16	349.00	152.75	145.63	63.22	–84.9
		SF_6	1.15	1.15	1.30	1.37	3.15	3.17	4.89	3.13	172.3
KP-LULUCF	Article 3.3[b]	CO_2					–103.27	–115.68	–135.68	–162.47	
		CH_4					NA	NA	NA	NA	
		N_2O					0.11	0.12	0.12	0.13	
	Article 3.4[c]	CO_2	–349.12				–501.53	–508.71	–515.98	–523.45	49.9
		CH_4	NA				NA	NA	NA	NA	NA
		N_2O	NA				NA	NA	NA	NA	NA

Abbreviations: KP-LULUCF = land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, NA = not applicable, NE = not estimated, NO = not occurring.

[a] "Base year" for Annex A sources refers to the base year under the Kyoto Protocol, which is1990 for all gases. The "base year" for cropland management, grazing land management and revegetation under Article 3, paragraph 4, of the Kyoto Protocol is 1990. For activities under Article 3, paragraph 3, of the Kyoto Protocol and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation.

[c] Elected activities under Article 3, paragraph 4, of the Kyoto Protocol, including forest management, cropland management, grazing land management and revegetation.

Table 2
Greenhouse gas emissions by sector and activity, base year[a] to 2011

			Gg CO_2 eq							*Change (%)*
		Sector	*Base year[a]*	*1990*	*1995*	*2000*	*2008*	*2009*	*2010*	*2011*	*Base year–2011*
Annex A		Energy	1 778.70	1 778.70	1 916.25	2 041.71	2 074.66	2 021.22	1 869.15	1 769.76	–0.5
		Industrial processes	869.03	869.03	546.11	976.45	2 019.53	1 860.61	1 889.78	1 798.44	106.9
		Solvent and other product use	9.07	9.07	7.51	8.31	7.18	6.31	6.15	6.30	–30.5
		Agriculture	753.96	753.96	687.14	698.19	723.86	699.14	689.75	687.46	–8.8
		Waste	144.75	144.75	179.12	196.23	215.93	211.32	210.08	198.07	36.8
		LULUCF	NA	1 171.40	1 108.77	1 015.02	858.86	834.57	795.80	746.28	NA
		Total (with LULUCF)	**NA**	**4 726.90**	**4 444.90**	**4 935.91**	**5 900.02**	**5 633.18**	**5 460.72**	**5 206.31**	**NA**
		Total (without LULUCF)	**3 555.50**	**3 555.50**	**3 336.13**	**3 920.89**	**5 041.16**	**4 798.61**	**4 664.92**	**4 460.03**	**25.4**
		Other[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA
KP-LULUCF	Article 3.3[c]	Afforestation and reforestation					–103.24	–115.64	–135.65	–162.80	
		Deforestation					0.08	0.08	0.08	0.46	
		Total (3.3)					**–103.16**	**–115.56**	**–135.57**	**–162.34**	
	Article 3.4[d]	Forest management					NA	NA	NA	NA	
		Cropland management	NA				NA	NA	NA	NA	NA
		Grazing land management	NA				NA	NA	NA	NA	NA
		Revegetation	–349.12				–501.53	–508.71	–515.98	–523.45	49.9
		Total (3.4)	**–349.12**				**–501.53**	**–508.71**	**–515.98**	**–523.45**	**49.9**

Abbreviations: KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NA = not applicable.

[a] "Base year" for Annex A sources refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The "base year" for cropland management, grazing land management and revegetation under Article 3, paragraph 4, of the Kyoto Protocol is 1990. For activities under Article 3, paragraph 3, of the Kyoto Protocol and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] Emissions/removals reported in the sector other (sector 7) are not included in Annex A to the Kyoto Protocol and are therefore not included in national totals.

[c] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation.

[d] Elected activities under Article 3, paragraph 4, of the Kyoto Protocol, including forest management, cropland management, grazing land management and revegetation.

II. Technical assessment of the annual submission

A. Overview

1. Annual submission and other sources of information

6. The 2013 annual inventory submission was submitted on 15 April 2013; it contains a complete set of common reporting format (CRF) tables for the period 1990–2011 and an NIR. Iceland also submitted the information required under Article 7, paragraph 1, of the Kyoto Protocol, including information on: activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, accounting of Kyoto Protocol units, changes in the national system and in the national registry, and the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol. The standard electronic format (SEF) tables were not submitted, as Iceland has not yet issued its assigned amount units and no Kyoto Protocol units have been acquired or transferred The annual submission was submitted in accordance with decision 15/CMP.1.

7. Iceland officially submitted revised emission estimates on 22 October 2013 in response to the list of potential problems and further questions raised by the ERT (see paras. 44, 45, 50, 51, 54 and 55 below). The values used in this report are those submitted by Iceland on 22 October 2013.

8. The full list of materials used during the review is provided in annex II to this report.

2. Overall assessment of the inventory

9. Table 3 contains the ERT's overall assessment of the annual submission of Iceland. For recommendations for improvements related to cross-cutting issues for specific categories, please see the paragraphs cross-referenced in the table.

Table 3
The expert review team's overall assessment of the annual submission

		General findings and recommendations
The expert review team's (ERT's) findings on completeness of the 2013 annual submission		
Annex A sources[a]	Complete	Mandatory: none
		Non-mandatory: Iceland has reported the notation key "NE" for: CO_2, CH_4 and N_2O emissions from lubricants in international marine bunkers, CH_4 and N_2O emissions from mineral wool production, CH_4 emissions from aluminium production, CO_2 emissions from food and drink, N_2O emissions from aerosol cans, CO_2 emissions from printing, tobacco, wood preservation and domestic solvent use under other, CH_4 emissions from poultry, CO_2 emissions from solid waste disposal and N_2O emissions from industrial and commercial wastewater
Land use, land-use change and forestry[a]	Not complete	Mandatory: Iceland has reported the notation key "NE" for: carbon stock change (CSC) from dead

		General findings and recommendations
		organic matter and mineral soils in forest land remaining forest land, CSC from organic soils in grassland converted to forest land, CO_2 emissions from forest land converted to cropland and other land converted to cropland, CO_2 emissions from mineral soils (cropland remaining cropland, some areas of grassland remaining grassland), CO_2 emissions from organic soils (in some areas of grassland remaining grassland), CO_2 emissions from all land converted to settlements except forest land, CO_2 emissions from land converted to other land, N_2O emissions from disturbance associated with land-use conversion to cropland on land converted to cropland and CO_2, CH_4 and N_2O emissions from biomass burning
		Non-mandatory: Iceland has reported the notation key "NE" for: CO_2 emissions from settlements remaining settlements and from other land remaining other land, CH_4 and N_2O emissions from drainage of mineral soils on forest land and peatland on wetlands, and CH_4 emissions from organic soils on grassland
KP-LULUCF	Not complete	See paragraphs 79–83 and 85 below
The ERT's findings on recalculations and time-series consistency in the 2013 annual submission	Generally consistent	Detailed explanations of recalculations and their quantitative impacts are provided in the NIR, resulting in generally transparent information. Information provided in chapter 10 is complete in relation to CRF table 8(a). CRF table 8(b) with explanations for recalculations has not been provided. The ERT recommends that Iceland provide this table
The ERT's findings on verification and quality assurance/quality control procedures in the 2013 annual submission	Sufficient	See paragraphs10 and 13 below for information on the QA/QC system. Several inconsistencies between the NIR and the CRF tables were identified in the sectoral chapters of this report (see paras. 35 and 46 below). The ERT recommends that Iceland enhance its QC checks related to the consistency of information between the CRF tables and the NIR
The ERT's findings on the transparency of the 2013 annual submission	Sufficient	Although overall the annual submission is transparent, specific areas for improvement have been identified for all sectors (see paras. 21, 24, 25, 29–30, 31 and 33 (energy), 40, 42, 43 and 45 (industrial processes), 57 (agriculture), 62 (LULUCF) and 72, 74, 75 and 77 (waste) below)
		The ERT finds that several notation keys are incorrect and recommends that Iceland review and, as appropriate, modify the notation keys (see paras. 26 and 47 below). Iceland has reported the notation key "NA" for most "other, please specify" categories (e.g. other (metal production)), for categories where the

	General findings and recommendations
	notation keys "NO" or "NE" would be correct. The ERT recommends that Iceland use the notation key "NO" for other categories, when it has assessed that emissions do not occur, and use the notation key "NE" when the categories occur, but have not been estimated (e.g. due to a lack of data or methodologies)

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, CRF = common reporting format, CSC = carbon stock change, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NA = not applicable, NE = not estimated, NIR = national inventory report, NO = not occurring, QA/QC = quality assurance/quality control.

[a] Assessment of completeness by the ERT considers only the completeness of reporting of mandatory categories (i.e. categories for which methods and default emission factors are provided in the Intergovernmental Panel on Climate Change (IPCC) *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, or the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*).

3. Description of the institutional arrangements for inventory preparation, including the legal and procedural arrangements for inventory planning, preparation and management

Inventory planning

10. In its NIR, Iceland described the national system for the preparation of the inventory, including the flow of information and the allocation of responsibilities. The Environment Agency of Iceland (EA), an agency under the auspices of the Ministry for the Environment and Natural Resources (MFE), has overall responsibility for the national inventory. EA compiles and manages the entire inventory, except for the information on the LULUCF sector, which is compiled by the Agricultural University of Iceland (AUI). EA collects and processes activity data (AD), selects methodologies and appropriate emission factors (EFs), ensures the conduct of quality management activities, and manages and implements the quality assurance/quality control (QA/QC) plan and the archiving system. A coordinating team was established in 2008 as part of the national system, comprising representatives of EA, AUI and MFE who are not directly involved in preparing the inventory. This team has the role of reviewing the inventory before its official submission to the UNFCCC secretariat by EA. Other agencies, ministries and organizations, such as the National Energy Authority of Iceland (NEA), the Farmers Association of Iceland, Statistics Iceland, the Soil Conservation Service of Iceland and the Iceland Forest Service, are also involved in the inventory preparation process, for the provision of AD and EFs.

11. In June 2012 a new law on climate issues (Act 70/2012), which will strengthen institutional arrangements and the flow of data to EA from other organizations, was enacted by the Icelandic Parliament. The law states that NEA (among other institutions) is obligated to collect the data necessary for the compilation of the GHG inventory and report them to EA. This requirement will be further elaborated in regulations set by the Minister for the Environment and Natural Resources, which are currently in preparation. Iceland indicated that the new law will also facilitate the preparation of the national energy balance.

12. According to Act 70/2012, NEA should provide an energy balance every year to EA; however, NEA has not yet fulfilled this provision (NIR, page 62) (see para. 20 below). In response to a question raised by the ERT during the review, Iceland explained that EA has sent a draft proposal of a regulation on data collection, based on Act 70/2012, to MFE, which will formalize the cooperation and data collection process. The ERT was informed that the regulation is likely to be published in the third or fourth quarter of 2013. The ERT

reiterates its strong recommendation made in the previous review report that Iceland complete the formal procedures as soon as possible and implement this agreement with NEA for the annual submission in 2014, in order to ensure that one organization has a full understanding of the complete energy balance and can compile a transparent and complete energy balance.

13. Although Iceland has implemented tier 1 QC procedures, few category-specific tier 2 QC procedures have been undertaken for key categories. The ERT encourages Iceland to continue developing category-specific tier 2 QC procedures for key categories, where applicable.

Inventory preparation

14. Table 4 contains the ERT's assessment of Iceland's inventory preparation process.

Table 4
Assessment of inventory preparation by Iceland

		General findings and recommendations
Key category analysis		
Was the key category analysis performed in accordance with the Intergovernmental Panel on Climate Change (IPCC) *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance) and the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF)?	Yes	
Approach followed?	Tier 1	The ERT reiterates the encouragement that Iceland use a tier 2 method for its key category assessment
Were additional key categories identified using a qualitative approach?	No	The ERT reiterates the encouragement that Iceland consider a qualitative approach to identifying possible additional key categories
Has Iceland identified key categories for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol following the guidance on establishing the relationship between the activities under the Kyoto Protocol and the associated key categories in the UNFCCC inventory?	Yes	The activities revegetation and afforestation/ reforestation have been identified as key categories
Does Iceland use the key category analysis to prioritize inventory improvements?	Yes	
Are there any changes to the key category analysis in the latest submission?	No	CO_2 emissions from the subcategories residential (other sectors) and agriculture/forestry/fisheries (other sectors) are no longer key categories when including LULUCF

		General findings and recommendations
Assessment of uncertainty analysis		
Approach followed?	Tier 1	
Was the uncertainty analysis carried out in accordance with the IPCC good practice guidance and the IPCC good practice guidance for LULUCF?	Yes	Iceland has revised the uncertainty calculation in several sectors (e.g. agriculture and waste). The revised uncertainties were very high for some categories (e.g. other (waste composting), the CH_4 EF uncertainty reported is 13,233.3 per cent). In response to questions, the ERT learned that there was a calculation error when implementing the IPCC good practice guidance method. The ERT recommends that Iceland check the uncertainties in the agriculture and waste sectors against IPCC default uncertainty values and correct any errors and, as an additional QC check, compare uncertainties used with those of some other countries
Quantitative uncertainty (including LULUCF)	Level = 33.5% Trend = 16.7%	
Quantitative uncertainty (excluding LULUCF)	Not provided Not provided	

Abbreviations: EF = emission factor, ERT = expert review team, LULUCF = land use, land-use change and forestry.

Inventory management

15. Iceland has an electronic archiving system, which includes the archiving of disaggregated EFs and AD, internal documentation on QA/QC procedures, external and internal reviews, and documentation on annual key categories and key category identification and planned inventory improvements. The NIR explained that some early documents used several years ago for the inventory compilation may not be available in this system, but such information has been systematically archived since the document management system was installed. Findings during the review indicate that not all essential information can be retrieved in the archiving system (see para. 30 below). The ERT recommends that Iceland check whether key AD or country-specific EFs or other country-specific parameters are without documentation and are still being used for the estimations of recent years. If such undocumented parameters that are still being used are identified, the ERT recommends that Iceland search for the sources of those parameters and add these sources in the archiving system, or revisit the choice of parameters if no sources can be identified. LULUCF data and information are not part of the centralized archiving system, but stored in the institutions responsible for the estimations in this sector.

Follow-up to previous reviews

16. Iceland implemented the following improvements based on recommendations made in previous review reports:

(a) Provided a description of the archiving system;

(b) Addressed data gaps in CRF table summary 3;

(c) Elaborated on the relevant details of the regulations of Act 70/2012;

(d) Changed from a tier 1 to a tier 3 method for CO_2 emissions from ferroalloys production (see para. 41 below);

(e) Changed from a tier 1 to a tier 3 method for emissions from aluminium production (see para. 42 below);

(f) Estimated additional sources of SF_6 emissions (see para. 46 below);

(g) Reassessed the value used for protein consumption for the estimation of emissions from domestic wastewater (see para. 75 below).

17. There are pending issues raised in recommendations in previous review reports that have not been addressed by Iceland in the 2013 annual submission, including:

(a) In relation to decision 14/CP.7, collecting plant-specific EFs for estimating CO_2 emissions and comparing the actual project-specific EFs with the world and/or European benchmarks in order to show the use of best available technology (BAT) for the projects. This activity is marked as implemented in the improvement plan, but no information was provided to the ERT during the review week that shows how BATs are used (see paras. 36–39 below);

(b) Preparation of a national energy balance by NEA and verification of the current emissions estimation in the energy sector based on such an energy balance (see para. 12 above and para. 20 below);

(c) Improving the differentiation of fuel consumption for international and domestic aviation (see para. 27 below);

(d) Improving the transparency of the methodology and data sources used for distinguishing between international and domestic navigation (see para. 28 below);

(e) Implementing and reporting on the improved methodology for estimating N_2O emissions from gasoline in road transportation;

(f) Implement a suitable tracking system for land subject to revegetation (see para. 85 below).

5. Areas for further improvement identified by the expert review team

18. During the review, the ERT identified a number of areas for improvement, including some related to specific categories. These are listed in the relevant chapters of this report and in table 8.

B. Energy

1. Sector overview

19. The energy sector is the second largest sector in the GHG inventory of Iceland, behind the industrial processes sector. In 2011, emissions from the energy sector amounted to 1,769.76 Gg CO_2 eq, or 39.7 per cent of total GHG emissions. Since 1990, emissions have decreased by 0.5 per cent. The key driver for the fall in emissions is a decrease in emissions from manufacturing industries and construction (decreased by 183.49 Gg CO_2 eq, or 48.7 per cent) and other sectors (decreased by 181.75 Gg CO_2 eq, or 25.8 per cent). Within the sector, 48.8 per cent of the emissions were from transport, followed by 29.6 per

cent from other sectors, 10.9 per cent from manufacturing industries and construction and 10.3 per cent from oil and natural gas (geothermal energy). The remaining 0.4 per cent were from energy industries. The contribution of GHG emissions from energy industries in Iceland is the smallest among other Parties included in Annex I to the Convention (Annex I Parties) (ranging from 0.4 per cent to 80.7 per cent) because most electricity is produced by geothermal and hydropower energy.

20. The NEA produces fuel consumption data by collecting data from oil companies on fuel sales by category. Iceland does not yet prepare an energy balance for the AD. Although NEA should provide an energy balance every year in accordance with Act 70/2012, as noted in paragraph 12 above, it has not yet fulfilled this provision. Iceland reported that NEA has already started some projects to fulfil its commitments with the aim of having a complete energy balance within two years. The ERT takes note of additional efforts by Iceland related to arrangements to compile an energy balance. The ERT further notes that an energy balance is an extremely valuable tool to ensure completeness and accuracy in the reporting of fuel consumption data in the energy sector, even in a situation as for Iceland with a very high share of renewable energy consumption and a lower importance of fossil fuel use. Although the ERT did not find specific evidence to suggest incomplete reporting in the energy sector, it strongly recommends that the Party work with EA to continue to make efforts to ensure that one organization has a full understanding of the complete energy balance and to ensure that the 2014 annual submission for the final year of the first commitment period is based on such an energy balance

21. Emissions from fuel combustion activities are estimated at the sectoral level based on the methodologies described by the Intergovernmental Panel on Climate Change (IPCC) *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines) and the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance). AD are provided by NEA, which collects data from the oil companies on fuel sales by sector. The division of fuel sales by category does not reflect the IPCC categories perfectly, so EA makes modifications to the data where needed to better reflect them (specifically for energy industries, manufacturing industries and construction, and other sectors). The methodology is provided in annex III to the NIR. However, the explanation of the modification process on fuel sale by category is insufficient, and the relationship between fuel sales data by category and fuel consumption data reallocated in accordance with the IPCC categories is not clear. The ERT recommends that Iceland provide more detailed information on the methodology for the modification of fuel consumption made by EA, based on the fuel sales data provided by NEA, and on the relationship between the data sets before and after the modification of fuel consumption, in order to enhance the transparency of AD.

22. Iceland provided planned improvements for the near future annual submissions in the NIR, specifically the preparation of a national energy balance, use of the COPERT model for road transportation and the application of a tier 2 methodology for civil aviation. In addition, Iceland stated that the development of country-specific EFs for fuels is under consideration. The ERT recommends that Iceland make its best efforts to proceed with these improvements in order to enhance the quality of its future inventory.

2. Reference and sectoral approaches

23. Table 5 provides a review of the information reported under the reference approach and the sectoral approach, as well as comparisons with other sources of international data. Issues identified in table 5 are more fully elaborated in paragraphs 24–29 below.

Table 5
Review of reference and sectoral approaches

		Paragraph cross-refererces
Difference between the reference approach and the sectoral approach	Energy consumption: 10.76 PJ, 51.12% CO_2 emissions: –12.20 Gg CO_2 eq, –0.80%	24
Are differences between the reference approach and the sectoral approach adequately explained in the NIR and the CRF tables?	No	24
Are differences with international statistics adequately explained?	No	25
Is reporting of bunker fuels in accordance with the UNFCCC reporting guidelines?	No	27, 28
Is reporting of feedstocks and non-energy use of fuels in accordance with the UNFCCC reporting guidelines?	Yes	29

Abbreviations: CRF = common reporting format, NIR = national inventory report, UNFCCC reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories".

Comparison of the reference approach with the sectoral approach and international statistics

24. Although the difference in CO_2 emissions between the sectoral approach and the reference approach was –0.80 per cent in 2011, the difference in energy consumption between the two approaches was quite large between 1990 and 2011, ranging from +5.8 per cent (1993) to +51.1 per cent (2011), and the difference in energy consumption has been getting larger in recent years (e.g. the difference nearly doubled between 2007 and 2008 (from 22.9 per cent to 42.2 per cent) before continuing to increase). In addition, in CRF table 1.A(c) in 2011, apparent energy consumption of liquid fuels (21.58 PJ) was smaller than apparent energy consumption (excluding non-energy use and feedstocks) (31.59 PJ), which is unreasonable. In response to questions raised by the ERT during the review, Iceland identified that this was due to an error because the amount of apparent energy consumption (excluding non-energy use and feedstocks) reported contains the energy content of electrodes. The ERT recommends that Iceland correct the data for apparent energy consumption (excluding non-energy use and feedstocks) in CRF table 1.A(c) and evaluate the differences between the reference approach and the sectoral approach.

25. Iceland provided an explanation for the differences in energy consumption between the CRF tables and the International Energy Agency (IEA) in the NIR (page 62). The reason for the differences identified by Iceland is the IEA conversion factors from physical units to energy units (although Iceland is not a member of the IEA it provided data to IEA on a voluntary basis) and the rounding of numbers; however, this explanation only partially explains the differences. For example, for civil aviation, 18.41 TJ are reported in CRF table 1.A(a), but zero is reported to the IEA. The ERT encourages Iceland to investigate the reason for the differences and provide further information on the differences.

26. In the reference approach table 1.A(b), and in CRF tables 1.A.(c) and 1.A.(d), Iceland has reported many fuels, for example, crude oil, orimulsion and natural gas liquids, with the notation key "NA" (not applicable) (whereas the sectoral report sheets use "NO" (not occurring)). Consistent with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories" (hereinafter referred to as the UNFCCC reporting guidelines), the ERT concludes that "NO" is the correct notation key. The ERT recommends that Iceland use the notation key "NO" when a specific fuel type of activity (production, import, export, stock change) does not occur. The use of "NA" is not correct in this situation and also not consistent with the information provided for the sectoral approach.

International bunker fuels

27. According to the NIR (pages 58–59), Iceland will have additional data available through participation in the European Union emissions trading system (EU ETS) for aviation to better differentiate fuel consumption between international and domestic aviation in the near future, and will implement a tier 2 methodology for aviation. In response to questions raised by the ERT during the review noting that this same intent was expressed in the previous NIR, Iceland confirmed that it was in the work plan to move to tier 2 in the 2013 annual submission but other priorities of the Icelandic inventory team (e.g. participating in the EU ETS) prevailed. Iceland noted that the staff is often moved to other tasks, limiting time for the inventory team to complete all planned improvements. The Party hopes to complete this task for the 2014 annual submission. The ERT reiterates the recommendation made in the previous review report that Iceland improve the differentiation of fuel consumption for international and domestic aviation.

28. According to the NIR (page 59), the amount of fuel sales for international and domestic navigation is divided using the identification numbers of ships to categorize them as Icelandic or owned by foreign companies This methodology is not consistent with the criteria for defining international and domestic marine transport provided in the IPCC good practice guidance. The ERT recommends that Iceland improve the methodology for distinguishing between international and domestic navigation in accordance with the IPCC good practice guidance.

Feedstocks and non-energy use of fuels

29. Iceland reported the carbon stored factors for coke oven coke, coking coal and electrodes in CRF table 1.A(d), in addition to lubricants and bitumen. Iceland indicated that all carbon included in coke oven coke, coking coal and electrodes is stored, except residues of electrodes combusted in the cement industry, and associated CO_2 emissions from oxidation of coke oven coke, coking coal and electrodes are reported under ferroalloys and aluminium production. The ERT recommends that Iceland provide the rationale for the choice of carbon stored factors for these raw materials to ensure the transparency of feedstocks and non-energy use of fuels and consistency between the energy and industrial processes sectors.

3. Key categories

Stationary combustion: liquid fuels – CO_2, CH_4 and N_2O[3]

[3] Not all emissions related to all gases under this category are key categories, particularly CH_4 and N_2O emissions. However, since the calculation procedures for issues related to this category are discussed as whole, the individual gases are not assessed in separate sections.

30. Iceland has reported a net calorific value (NCV) and carbon content of waste oil (respectively, 20.06 TJ/kt and 23.92 t C/TJ) for manufacturing industries and construction in its NIR (page 53, table 3.8), but the data source is not provided. In response to a question raised by the ERT during the review, Iceland explained that the reference of the NCV and carbon content of waste oil could not be found because these values have been used for a long time. The ERT recommends that Iceland review whether or not the NCV and carbon content of waste oil are appropriate for the national circumstances of Iceland and provide information on the result of the evaluation. If Iceland cannot justify the use of the current EF the ERT recommends that the Party revise the EF or use the IPCC default value.

31. Iceland explained in the NIR (page 53) that the EFs for CH_4 and N_2O for liquid fuels use in manufacturing industries and construction are taken from the tables in the Revised 1996 IPCC Guidelines. However, the values of EFs for CH_4 and N_2O used in the emission estimation, by liquid fuel type, are not provided. In response to a question raised by the ERT during the review, Iceland provided the table which includes values of CH_4 and N_2O EFs by each fuel type. The ERT recommends that Iceland include this information on the CH_4 and N_2O EFs used, by each fuel type, the detailed reference for each EF and its rationale for the choice of EFs to improve transparency.

Road transportation: liquid fuels – CH_4 and N_2O[4]

32. Iceland provided the future improvement plan for the methodology for estimating GHG emissions from road transport in its NIR (page 57), which will apply the COPERT model. EA has already contacted the Icelandic Road Traffic Directorate (IRTD) to request the necessary data; however, it was identified in the NIR that IRTD did not have all of the necessary data for COPERT. Therefore, EA will put efforts into working with IRTD to initiate work on the data needed for COPERT. For example, IRTD informed EA that the requested data could be determined for only a small fraction of the vehicle fleet, that is, new cars imported since 2000. The categorization of other parts of the vehicle fleet (i.e. all cars imported before 2000, used cars imported since 2000 and all other vehicle types imported, both new and used at any time) was not deemed possible, at least until further and extensive analyses which have not yet taken place due to a lack of resources. The ERT commends Iceland for providing the future improvement plan in its NIR and starting to consider the application of COPERT in order to improve the quality of its estimates of emissions from road transportation. The ERT recommends that Iceland continue to make efforts to apply COPERT to the calculation of GHG emissions from road transportation in a future annual submission.

4. Non-key categories

Oil and natural gas – CO_2 and CH_4

33. Although CO_2 and CH_4 emissions from the distribution of oil products are reported for the first time in the 2013 annual submission, the explanation of the methodology for estimating these emissions is not provided in the NIR. In response to a question raised by the ERT during the review, Iceland provided the description of the methodology for this category. The FRT finds that, based on the description, the methodology is in accordance with the IPCC good practice guidance and the IPCC default CO_2 and CH_4 EFs are used (the CO_2 EF is 2.30 X 10^{-6} Gg per 1,000 m^3 transported by tanker truck and the CH_4 EF is 2.50 X 10^{-5} Gg per 1,000 m^3 transported by tanker truck). The ERT recommends that Iceland

[4] Not all emissions related to all gases under this category are key categories, particularly CH_4 emissions. However, since the calculation procedures for issues related to this category are discussed as whole, the individual gases are not assessed in separate sections.

include the methodological information for estimating GHG emissions from this category in its NIR.

C. Industrial processes and solvent and other product use

1. Sector overview

34. The industrial processes sector is the main sector in the GHG inventory of Iceland. In 2011, emissions from the industrial processes sector amounted to 1,798.44 Gg CO_2 eq, or 40.3 per cent of total GHG emissions, and emissions from the solvent and other product use sector amounted to 6.30 Gg CO_2 eq, or 0.1 per cent of total GHG emissions. Since 1990, emissions have increased by 106.9 per cent in the industrial processes sector, and decreased by 30.5 per cent in the solvent and other product use sector. The key drivers for the rise in emissions in the industrial processes sector are the increase in emissions from metal production, in particular CO_2 emissions from ferroalloys (ferrosilicon) and aluminium production, and the consumption of halocarbons and SF_6. The increase in emissions is partially offset by a decrease in CO_2 emissions from mineral products and CH_4 emissions from chemical industry. Within the industrial processes sector, 91.9 per cent of the emissions were from metal production, followed by 6.9 per cent from consumption of halocarbons and SF_6. The remaining 1.2 per cent were from mineral products. The increase in emissions in this sector is dominated by substantial capacity expansions in aluminium and ferrosilicon production. Due to the fact that energy from renewable sources is used, this capacity expansion has little impact on emissions in the energy sector.

35. The ERT noted that the NIR of the 2013 annual submission considers all categories within this sector in a structured manner, including information on QA/QC procedures, uncertainties and recalculations by category. However, the ERT noted that there are still some minor QC issues relating to reporting where elements from the 2012 NIR have not been updated in the 2013 annual submission. For example, the NIR (page 71) provides an implied emission factor (IEF) range of 3.08 to 3.52 t CO_2/t ferrosilicon, whereas in CRF table 2(I)A-G, this range is 3.13–3.60 t/t. In a second example, the product manufacturing EF for transport refrigeration in the NIR (table 4.8) is 1.0 per cent while the same EF in CRF table 2(II)F is reported as 2.0 per cent. In response to questions raised by the ERT during the review, Iceland confirmed that in both cases the CRF tables were correct. These types of QC errors were also observed in previous review reports. The ERT reiterates the recommendation made in previous review reports that Iceland improve its QC procedures in order to publish a consistent and accurate NIR and CRF tables.

2. Decision 14/CP.7

36. Iceland wishes to avail itself of the provisions of decision 14/CP.7 and therefore has provided information in the NIR on four possible eligible projects: three in aluminium production and one in ferrosilicon (FeSi) production. Two of the projects concern the expansion of plants already existing before 1990, and the other two are greenfield plants from the mid-1990s. Each of the projects fulfils the requirement that it emit more than 5 per cent of Iceland's 1990 emissions (ranging between 6.0 and 23.8 per cent). The total amount of CO_2 emissions in 2011 from these four projects amounts to 1,208.70 Gg CO_2, or 67.2 per cent of the industrial processes sector emissions, or 27.1 per cent of the total GHG emissions of Iceland.

37. The projects use renewable electricity (only 0.01 per cent of Iceland's electricity is reported to be generated by non-renewable sources; see the 2013 NIR, page 77). In its calculations of the emissions savings, Iceland has allowed for this share of non-renewable electricity by subtracting the emissions from electricity consumption from the emissions savings, using a weighted average EF for GHGs of 11.7 g/kWh for 2011 (see the 2013 NIR,

page 77). However, the ERT noted that Iceland has used an old reference for the EF for the gas-fired electricity plant used as a reference to estimate the emissions savings: the 600 g CO_2/kWh currently applied corresponds to an electric efficiency of only 34.0 per cent. By doing so, the Party has considerably overestimated the emissions savings. State-of-the-art gas-fired power stations have an electric efficiency of at least 50–55 per cent, corresponding to an EF of 371 to 408 g CO_2/kWh. The ERT recommends that Iceland use up-to-date references to estimate the emissions savings from electricity consumption by the projects it wishes to report under decision 14/CP.7.

38. Despite recommendations made in previous review reports, Iceland has not reported in its 2013 annual submission on a comparative – quantitative and/or benchmarking – analysis of the plants concerned to provide evidence that they use BAT. Not reporting this information, is as such, not fulfilling the requirements of paragraph 2(c) of decision 14/CP.7. Regarding best environmental practice, Iceland has provided information that certified environmental management systems according to International Organization for Standardization (ISO) 14001 or ISO 9001 are in place for the projects. In response to an earlier draft of this report, and the conclusion that Iceland did not provide evidence that BAT is used to minimize process CO_2 emissions and hence that the reporting on the single projects does not fulfil all the requirements of decision 14/CP.7 and CO_2 emissions from these projects could not be subtracted from the national total in the first commitment period, the Party did provide evidence based on a comparison between IEFs and EFs, as mentioned in the Best Available Techniques reference document for the non-ferrous metal industries (BREF). Although the Party only compared the CO_2 and PFC emissions of the aluminium producing plants with the upper levels of the BREFs, the IEFs for CO_2 and PFC lie within the lower and upper level of BAT. For other emissions (sulphur dioxide (SO_2), dust and fluorides) the Party provided data illustrating that the IEFs are within the range or below the emission levels expressed in the BREFs.

39. Based on this information, the ERT concludes that these three aluminium-producing installations are adhering to BAT and thus the requirements of 14/CP.7 are fulfilled. However, the ERT reiterates the recommendation made in previous review reports that Iceland include this information in its next NIR in order to provide the necessary information allowing it to avail itself of the provisions of decision 14/CP.7. Regarding the ferrosilicon plant, the additional information provided does not let the ERT conclude that it adheres to BAT: it is not clear whether the provided plant CO_2 emissions include those of biomass-based products (charcoal and waste wood (mentioned in table 4.3 and 4.4 of the NIR 2103)). The ERT recommends that the Party provide similar detailed tables with volumes and carbon contents for the extension to the ferrosilicon plant it desires to make subject to 14/CP.7. In the absence of such information, the ERT cannot conclude that the emissions from this plant extension can be subtracted from the national total, as not all conditions of 14/CP.7 are fulfilled.

3. Key categories

Cement production – CO_2

40. Although the NIR contains a detailed table with the cement production, calcium oxide content and cement kiln dust factor applied in order to estimate CO_2 emissions from cement production, and the CRF tables contain clinker AD, no information has been presented to explain the variable and recently highly variable trend in AD (e.g. 2008–2009 AD declined by 53.1 per cent and for 2009–2010 AD declined by 43.7 per cent, whereas for 2010–2011 AD increased by 14.0 per cent) and in the resulting emissions. The ERT recommends that the Party improve the transparency of its NIR by providing explanatory information on trends.

Ferroalloys production – CO_2

41. On 1 January 2013, the single Icelandic ferrosilicon producer joined the EU ETS, which required it to provide plant-specific data on the carbon content of the electrodes used in the process. The producer did so for the entire time series 1990–2011. As such, Iceland's methodology moved from a tier 1 applied in the previous annual submission to tier 3, which is appropriate for this key category and has been included in recommendations made in previous review reports. The ERT commends Iceland for providing a table in the NIR with details on the carbon mass balance for this category. The ERT notes that, in the NIR, Iceland refers to the use of imported iron pellets, which often contain a small amount of carbon. In response to a question raised by the ERT during the review, the Party confirmed that the pellets used in this process are carbon free. The ERT accepts this response and encourages the Party to continue to provide information on the carbon mass balance for this category.

Aluminium production – CO_2 and PFCs

42. As required under the EU ETS, which they joined on 1 January 2013, the Icelandic aluminium producers provided plant-specific data on the carbon content of the electrodes used in the process for the entire time series 1990–2011. As such, Iceland's methodology moved from a tier 1 applied in the previous annual submission to tier 3, which is appropriate for this key category and has been included in recommendations made in previous review reports. The ERT noted, however, that the transparency of the methodology description and information provided in the NIR could be improved. For example, the presented weighted anode effect for all three aluminium plants gives an indication of the extent of the anode effect in the three plants, but cannot be directly used to reproduce the provided PFC emissions. According to the Party, emissions are estimated for each plant separately, by multiplying the anode effect for each plant with the slope factors to calculate a plant-specific EF that is multiplied with the aluminium production per plant. The ERT recommends that Iceland improve the methodological description in the NIR in order to increase transparency between the tables and text.

Consumption of halocarbons and SF_6 – HFCs and SF_6

43. The ERT welcomes the efforts made by Iceland to improve the methodology applied to estimate emissions in this category, in particular for refrigeration and air conditioning (e.g. further disaggregation of subcategories of refrigeration and air conditioning from three to six subcategories; estimation, for the first time, of initial and end of life HFC emissions; and estimation of emissions from refrigerated containers). Although the ERT raised some issues for clarification during the review regarding the method used (e.g. regarding Iceland's assumptions that the amount of substances remaining in products at the time of decommissioning minus the emissions of the losses at disposal remain as stock because the substances are drained, cleaned and reused; and about the refilling of reefers), based on the responses provided by Iceland the ERT concluded that the method did not underestimate emissions and, in fact, there could even be some small overestimations. The ERT recommends that Iceland continue to improve the methodology applied, and ensure time-series consistency among the amount of substances and emissions categories (fillings, stocks, disposal). The ERT also recommends that Iceland ensure that the approach and underlying assumptions are transparently described in the NIR.

44. Iceland has reported emissions from foam blowing as "NO" in the CRF tables; however, foam blowing is not addressed in the NIR and the subcategory is not included in the list of banned HFC applications (NIR page 82). In response to a question raised by the ERT during the review, the Party provided evidence that no HFCs are used in foam products used for marine activities. However, no information was provided about the use of

HFCs in on-shore applications and the Party agreed that there might be emissions from this use occurring in Iceland. As the use of foam products is a common application in most countries, the current approach of reporting emissions as "NO" could potentially result in an underestimation of emissions. This issue was included in the list of potential problems and further questions raised by the ERT during the review.

45. In response to the list of potential problems and further questions raised by the ERT during the review, Iceland elaborated on its national regulations (230/1998, superseded by 834/2010) banning certain uses of fluorinated gases (F-gases). The law bans HFC use as a foam blowing agent or contained in imported hard cell foams. Because one entity in Iceland had applied for an exemption to import HFCs as a foam blowing agent, the Party in its response to a question raised by the ERT during the review, assumed there could be limited emissions from this category. Iceland has since learned that although permission was granted for import, the entity did not import the gas because it was too expensive, and therefore use of the notation key "NO" is correct. The ERT accepts the Party's response and considers the issue resolved. However, the ERT recommends that the Party report more transparently on this issue in its NIR. Furthermore, the ERT recommends that the Party further investigate and report on potential use of HFCs following the lifting of the ban on HFC import from 1 January 2013 onwards.

46. For its 2013 annual submission, Iceland moved from an approach estimating SF_6 emissions at the application level to an approach based on a combination of measurement and calculation data, with resulting changes in the SF_6 EF. In addition, Iceland included additional SF_6-containing equipment in the inventory that was previously missing, specifically SF_6 used in voltage gear at aluminium smelters and aluminium foil producers. Although the NIR is comprehensive in its description of the methodology, the underlying numerical data are missing in the CRF tables: data in CRF table 2(II)F are not provided, although they were made available to the ERT in response to questions it raised during the review. The ERT strongly recommends that Iceland ensure consistency and completeness by providing the available data in the relevant CRF tables.

47. Iceland has reported the notation key "NO" for potential emissions of F-gases, but reported actual emissions of F-gases in CRF table 2(I). The notation key "NE" (not estimated) would be correct in this situation as potential emissions can occur for all sources for which actual emissions are estimated. The ERT encourages Iceland to report potential emissions; however, if the Party is unable to do so, the ERT recommends that Iceland report potential emissions as "NE" in the CRF tables.

D. Agriculture

1. Sector overview

48. In 2011, emissions from the agriculture sector amounted to 687.46 Gg CO_2 eq, or 15.4 per cent of total GHG emissions. Since 1990, emissions have decreased by 8.8 per cent. The key drivers for the fall in emissions are an overall decrease in the number of cattle (from 74,900 in 1990 to 72,770 in 2011), a decrease in the number of sheep (from 861,820 in 1990 to 741,470 in 2011), a decrease in the consumption of fertilizers (from 11,224 t nitrogen (N) in 1990 to 9,372 t N in 2011) and a decrease in the area of drained organic soils (from 65,120 ha/year in 1990 to 57,725 ha/year for 2011). Within the sector, 49.5 per cent of the emissions were from agricultural soils, followed by 37.1 per cent from enteric fermentation and 13.5 per cent from manure management.

49. The previous review report identified inconsistencies between the NIR and the CRF tables and between CRF tables, and recommended that Iceland enhance QC activities. Specifically, an error was identified in relation to the allocation of CH_4 emissions from

manure management for goats between solid storage and pasture. A second inconsistency was identified in the area of cultivated organic soils reported in CRF tables 4.D and 5.B. The ERT notes that these errors have been corrected in the 2013 annual submission, and acknowledges and welcomes the improvement.

2. Key categories

Enteric fermentation – CH_4

50. Emissions from enteric fermentation for all cattle categories have been estimated using the IPCC tier 2 method with country-specific data (e.g. cattle weight, milk production, fat content, feed digestibility and percentage of time spent grazing). The Icelandic cattle herd is an ancient breed with a low live average weight of 450 kg and an average milk production of 5,436 litres/dairy cow/year in 2011. When estimating the gross energy (GE) intake, Iceland, in most cases, used a country-specific digestibility rate (DE) of 78.72 per cent, which is the highest among all reporting Parties and outside the default range for cattle in the IPCC good practice guidance (60–75 per cent). A high DE in combination with the IPCC tier 2 methodology yields a low GE intake and subsequently a low level of CH_4 emissions. This also affects CH_4 emissions from manure management (see paras. 54 and 55 below). The average CH_4 emissions from Icelandic mature dairy cows in 2011 had been estimated at 75.60 kg CH_4/head/year, which is among the lowest of all Annex I Parties (ranging from 65.97 to 144.70 kg CH_4/head/year). For mature non-dairy cattle, the average CH_4 emissions from Icelandic cattle in 2011 (44.06 kg CH_4/head/year) was the lowest of all Annex I Parties (ranging from 44.06 kg CH_4/head/year to 89.99 kg CH_4/head/year). During the review, the ERT asked for a detailed explanation of this high DE. Iceland informed the ERT that it was unable to provide further details on how the DE was selected within the review week. A study by Ketilsdóttir and Sveinsson (2010a) where the amount of manure from dairy cattle was measured gave a daily excretion rate of 4.9 kg dry matter per day. This indicates a much lower DE than that used in the current annual submission. The ERT therefore included this issue in the list of potential problems and further questions raised by the ERT during the review, recommending that Iceland submit revised estimates of the CH_4 emissions from enteric fermentation using the IPCC default DE for Western Europe of 60.0 per cent for cattle groups in its inventory.

51. On 22 October 2013, Iceland submitted revised estimates for CH_4 emissions from enteric fermentation for cattle using the default DE values of 60.0 per cent for mature dairy cattle and mature non-dairy cattle and young cattle from the IPCC good practice guidance. The revised estimates increased CH_4 emissions from cattle by 1.32 Gg CH_4, or 38.4 per cent (with the IEF for mature dairy cattle increasing to 109.87 kg CH_4/head/year, the IEF for mature non-dairy cattle increasing to 56.54 kg/year and the IEF for young cattle increasing from 16.1 kg/year to 21.43 kg/year). Iceland has also indicated that it intends to update the default DE values with country-specific values in its next annual submission. The ERT accepts the Party's response and considers the issue resolved. The ERT commends the Party for its efforts.

52. For sheep, Iceland used the IPCC tier 2 methodology in combination with country-specific information on weight and productivity of meat and wool. Iceland used a DE of 69.0 per cent, which is within the range in the IPCC good practice guidance for "good pastures", but outside the default values for range land (50.0–60.0 per cent). In response to questions raised by the ERT during the review regarding the source of the country-specific value used, Iceland was unable to verify how the DE rates used were estimated, although it did indicate that it planned to review all DE values for the 2014 annual submission. The ERT strongly recommends that Iceland document the assumptions behind this value, taking into account forage quality during grazing on scrubland and unfertilized grassland, which is common practice in Iceland, and forage quality during the stall period in winter. The ERT

encourages Iceland to include in the documentation measured DE rates for the different forage components and their share of the feed for sheep.

53. For all other animal categories Iceland used tier 1 methodologies, which is in accordance with the IPCC good practice guidance.

3. Non-key categories

Manure management – CH_4 and N_2O

54. Iceland used an IPCC tier 2 methodology to estimate the amount of organic matter in manure and the subsequent CH_4 emissions from manure management. The amount of organic matter or volatile solids (VS) in the manure depends on the GE intake (see para. 50 above). The ERT notes that the amount of VS would be underestimated if the GE intake is underestimated. As an example, Iceland estimated the amount of VS in manure to be 2.04 kg dry matter/mature dairy cattle/day in 2011. In response to questions raised by the ERT during the review, Iceland provided a national study (Ketilsdóttir and Sveinsson, 2010a) which showed that the daily average dry matter excretion by dairy cattle is estimated to be 4.9 kg dry matter per day, or equivalent to 3.6–4.0 kg VS/mature dairy cattle/day, assuming a VS of 73–81 per cent of dry matter (Ketilsdóttir and Sveinsson, 2010b). The estimated CH_4 emissions from manure management in the inventory for mature dairy cattle are therefore only 51–57 per cent of what they would be if the data in the national study were used in the inventory. Iceland informed the ERT that the data in the study is average data for Icelandic conditions. The ERT concludes that, due to the use of a high DE rate by Iceland, a low feed intake is estimated, yielding a low VS excretion level and a potential underestimation of CH_4 emissions. The ERT therefore included this issue in the list of potential problems and further questions raised by the ERT.

55. On 22 October 2013, Iceland submitted revised estimates for CH_4 emissions from manure management for all cattle categories using the default DE values of 60.0 per cent from the IPCC good practice guidance. This resulted in an increase in the VS excretion for all cattle types from 2.04 to 5.57 kg dry matter/day for mature dairy cattle, from 1.68 to 2.87 kg dry matter/day for mature non-dairy cattle and from 0.43 to 0.95 kg dry matter/day for young cattle. The revised estimates increased the CH_4 emissions from manure management for cattle by 0.90 Gg CH_4, or 126.3 per cent. Iceland has also indicated that it intends to update the default DE values with country-specific values in its next annual submission. The ERT accepts the Party's response and considers the issue resolved. The ERT commends the Party for its efforts.

56. For sheep, Iceland used a tier 2 methodology from the IPCC good practice guidance, as mentioned in paragraph 52 above. If the recommended evaluation of the Icelandic DE for sheep shows that the currently applied 69.0 per cent is an overestimation, this will also have consequences for the CH_4 emissions from manure management. The ERT recommends that, based on the results of the investigation described in paragraph 52 above, Iceland evaluate whether a recalculation for the entire time series for CH_4 emissions from manure management is necessary.

57. The nitrogen excretion rates (Nex) for mature dairy cattle are based on measured country-specific data for dairy cattle. In 1990, the Nex in the inventory is 72.00 kg N/dairy cow/year and in the later years an average measured Nex of 94.79 kg N/dairy cattle/year has been applied (Ketilsdóttir and Sveinsson, 2010a). The default Nex value in the IPCC good practice guidance for Western European conditions is 100 kg/dairy cow/year based on a milk production of 4,200 litres. The Icelandic milk production is 5,435 litres/dairy cow/year and from smaller cows than the default Western European dairy cows size (550–700 kg). The Nex values used for the later years are below the default Western European value. Because there is a lack of transparency regarding how the data from Ketilsdóttir and

Sveinsson (2010a) has been scaled up to average national Nex data, the ERT strongly recommends that Iceland include more information in the NIR regarding the circumstances under which the country-specific Nex data have been estimated to demonstrate that emissions have been accurately reported.

58. For all other animal types, default Nex values from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the 2006 IPCC Guidelines) are used. These are based on Nex values per 1000 kg of animal mass/day. For these animal types the ERT recommends that Iceland verify the animal weights used in the calculations because some of these Nex values seemed to be overestimated, based on the experience of the ERT. In addition, the country-specific animal weights differ substantially from the values given in the 2006 IPCC Guidelines (e.g. the weight of broilers (4 kg) is equivalent to the weight of geese and ducks. This yields a higher Nex from broilers than from geese (1.6 kg Nex and 1.2 kg Nex, respectively). In the 2006 IPCC Guidelines the default weight for broilers was estimated to be 0.9 kg).

Agricultural soils – N_2O

59. Estimates of N_2O emissions from cultivation of histosols are based on a country-specific study (Guðmundsson 2009) that was provided to the ERT in response to questions it raised during the review. These data have not been published in a peer-reviewed article. In this study, Iceland has measured N_2O emissions from cultivated organic soils and permanent organic grassland over three years. To get the annual EF, the mean value for each month has been calculated and then the mean values calculated over the months. The measured value for permanent, unfertilized grassland of approximately 1 kg N_2O–N/ha is low compared with the general recommended EF in the IPCC good practice guidance (8 kg N_2O–N/ha) but in line with other measured values found in the literature for unfertilized grassland with a carbon to nitrogen (C/N) value of 15–16. In the autumn months, the measured N_2O emissions are negative but within one standard deviation of the mean. Negative emissions cannot be seen as human-induced emissions. The ERT considers that the averaging over the monthly measurements, including the negative values to get the currently used average EF could be an underestimation if the negative values in the autumn are caused by climatic factors and not attributed to the general uncertainty in the measurements. The ERT therefore recommends that Iceland analyse the data further and verify that the negative emissions are not caused by the climate or other non-human induced factors, and if the negative emissions are found to be climate related they should be removed from the averaging Iceland is furthermore recommended to include a comparison of the country-specific value with peer-reviewed studies.

E. Land use, land-use change and forestry

1. Sector overview

60. In 2011, net emissions from the LULUCF sector amounted to 746.28 Gg CO_2 eq. Since 1990, net emissions have decreased by 36.3 per cent. The key drivers for the fall in emissions are, to a large extent (62.0 per cent of the decline) a reduction in emissions in cropland and grassland on drained organic soils. Within the sector, 1,072.41 Gg CO_2 net emissions were from cropland, followed by 78.03 Gg CO_2 net emissions from other (LULUCF), 18.05 Gg CO_2 net emissions from wetlands and 0.46 Gg CO_2 net emissions from settlements. Forest land accounted for net removals of 249.45 Gg CO_2 and grassland accounted for net removals of 173.21 Gg CO_2.

61. The previous review report recommended that Iceland, in its NIR, present an annual land-use and land-use change matrix to identify and track, according to selected conversion periods, all land use and land-use changes. The ERT welcomes the inclusion of this matrix

in response to recommendations made in previous review reports. In addition, the ERT welcomes the improved descriptions of methodologies followed and parameters used.

2. Key categories

Forest land remaining forest land – CO_2

62. Iceland has reported continuous net removals in the category forest land remaining forest land over the entire time series 1990–2011. Iceland reported this category using a tier 3 method (including use of models and measurement) for estimating carbon stock changes (CSC) from living biomass, divided into three subcategories (afforestation older than 50 years, natural birch forest and plantations in natural birch forest) and a tier 1 approach to estimate emissions from organic soils in the subcategories afforestation older than 50 years and natural birch forests. The ERT recommends that Iceland provide an additional description of, and/or references to, the scientific basis for the models or measurements used to estimate CSC, and a description of the process by which CSC and emissions or removals are estimated.

63. Iceland used a tier 1 approach for estimating CSC from organic soils in the subcategories afforestation older than 50 years and natural birch forest. Emissions from organic soils in plantations in natural birch forest have been reported as "NO". The ERT recommends that Iceland use a higher-tier methodology to estimate CO_2 emissions from organic soils as drained organic soils are normally a major pool of CO_2 emissions (consistent with the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF)). The ERT also recommends that Iceland report CSC in dead organic matter (DOM) and mineral soils.

Land converted to forest land – CO_2

64. The area of organic soils and CSC in organic soils in grassland converted to forest land has been reported as "NE" in the subdivision afforestation natural birch forest 1–50 years. The ERT recommends that Iceland develop a country-specific EF and AD for the estimation of CSC in organic soils as land converted to forest land is a key category.

Land converted to cropland – CO_2

65. Iceland reports "IE" (included elsewhere) in CRF table 5.B for DOM for grasslands and wetlands converted to cropland (reported under total biomass lost in the respective land-use conversions), as well as net CSC in organic soils for grassland converted to cropland (reported under wetlands converted to cropland). Iceland reported in the NIR that there are presently no data available for the separation of conversion into more categories and therefore reported all land-use conversions as aggregated under grassland converted to cropland and wetlands converted to cropland. However, the ERT notes that, since land converted to cropland is a key category, consistent with the IPCC good practice guidance for LULUCF, all land-use conversions should be reported separately, that is, forest land conversions and grassland conversions. The ERT therefore recommends that Iceland report CSC from conversion to cropland in a disaggregated manner.

Land converted to grassland – CO_2

66. Iceland has reported continuous removals from this category using a tier 1 approach for the entire time series with an increasing trend (–0.28 Mg C/ha in 1990 to –0.83 Mg C/ha in 2011). According to the NIR (page 178), there is unpublished information that the Party intends to use to develop country-specific EFs for other land converted to grassland in the 2014 annual submission. The ERT recommends that the Party make efforts to develop estimates based on country-specific data (tier 2) and report on the improvements, as other land converted to grassland is a key category.

3. Non-key categories

Grassland remaining grassland – CO_2

67. Iceland's NIR (page 177) reports that large areas of degraded grassland, which are likely to be a source of emissions, have not been included in the inventory. In response to questions raised by the ERT during the review, the Party indicated that data are presently unavailable and inclusion of estimates is pending. The ERT recommends that Iceland report emissions from all areas of grassland, consistent with the IPCC good practice guidance for LULUCF.

Non-CO_2 emissions from drainage of soils and wetlands – N_2O

68. The N_2O IEF for drainage of soils and wetlands (0.60 kg N_2O-N/ha) is the highest among reporting Parties (ranging from 0.084 to 0.60 kg N_2O-N/ha). In response to questions raised by the ERT during the review, Iceland cited the use of default values from the 2006 IPCC Guidelines. The ERT notes that there are two default values presented in the 2006 IPCC Guidelines, one for organic nutrient-poor forest soils (0.1 kg N_2O-N/ha) and the other for organic nutrient-rich forest soils (0.6 kg N_2O-N/ha[1]). The ERT notes that these are the same values presented in the IPCC good practice guidance (table 3a.2.1). The ERT recommends that Iceland justify the use of the current EF and differentiate the EF by soil type.

F. Waste

1. Sector overview

69. In 2011, emissions from the waste sector amounted to 198.07 Gg CO_2 eq, or 4.4 per cent of total GHG emissions. Since 1990, emissions have increased by 36.8 per cent, mainly due to increased emissions from solid waste disposal sites. The key drivers for the rise in emissions were an increased amount of landfilled waste until the early years of the twenty-first century, and a shift from unmanaged to managed landfills. However, emissions are no longer increasing and, since 2006, emissions have decreased by 11.9 per cent, mainly as a result of increased recycling. Within the sector, 88.6 per cent of the emissions were from solid waste disposal on land, followed by 5.8 per cent from wastewater handling and 4.3 per cent from waste incineration. The remaining 1.3 per cent were from other (composting).

70. The NIR contains clearly structured information and the applied methodologies are well described. However, consistent with recommendations in the previous review report, the ERT considers that there is room for improvement regarding transparency of the report. Not all recalculations are sufficiently explained (e.g. reassessment of removed sludge in chapter 8.3.4 of the NIR) and some important background data, including AD, are missing (see paras. 72 and 74 below). The ERT also noted some inconsistencies in the NIR, for example: table 8.8 contains an incorrect value for the methane correction factor (MCF) used (see para. 73 below); the caption and legend of figure 8.7 does not reflect current changes in the methodology; and the text in chapters 8.2.7 and 8.3.6 is identical. The ERT therefore recommends that Iceland enhance its QA/QC activities on the NIR.

2. Key categories

Solid waste disposal on land – CH_4

71. For the only key category in this sector, Iceland has applied a tier 2 first-order decay (FOD) model. Moreover, the Party used a tailored version of the IPCC FOD waste model that allows for the inclusion of more waste categories with country-specific parameters. The

ERT commends the Party for this practice. Currently, Iceland incorporates 10 waste types into its calculations, covering all waste generated in Iceland. Consistent with its planned improvements, as well as following recommendations made in the previous review report that Iceland provide more information about the inclusion of slaughterhouse waste with food waste, Iceland has introduced a new waste category, food industry waste. This allowed the Party to separate out fish and meat processing waste from the broad category "food waste" to a new category "food industry waste" and apply country-specific degradable organic carbon and decay rate values. The methodology with all the important parameters is well described in the NIR. The ERT commends the Party for this improvement.

72. The ERT noted that compared with the previous annual submission, CH_4 recovery has a greater influence on the emission levels. The total amount of CH_4 recovered increased in almost all years of the time series (by 70.1 per cent on average). In response to a question raised by the ERT during the review regarding whether the CH_4 recovery data are based on measurements, Iceland replied that this is mostly the case. Recovery data for earlier years of the time series are based on expert judgement, while those for more recent years are based on measurements and sales figures with some estimations regarding CH_4 losses and own use of CH_4 for fuel consumption in on-site vehicle fleets. The ERT notes that, according to the IPCC good practice guidance, the default value for CH_4 recovery is zero unless references documenting the amount of CH_4 recovery are available. Therefore the ERT considers that including all relevant background information on recovered landfill gas (e.g. amount, CH_4 concentration, purity) in the NIR is required to ensure transparency of reporting. Therefore the ERT recommends that Iceland clearly provide documentation in the NIR to indicate to what extent CH_4 recovery data are based on measurements and to what extent they are based on estimates. Furthermore, the ERT strongly recommends that Iceland include in the NIR more information on landfill gas utilization (e.g. energy content of recovered gas, place of utilization).

3. Non-key categories

Wastewater handling – CH_4 and N_2O

73. Taking into account its specific domestic circumstances (e.g. cold climate, strong sea currents, small population), Iceland has reported CH_4 emissions from septic systems only. Based on the 2006 IPCC Guidelines, Iceland applied a default MCF of 0.5. The ERT noted, however, that in table 8.8 of the NIR, Iceland has reported a different value for the MCF (0.3). In response to questions raised by the ERT during the review, Iceland confirmed that it used the default value of 0.5 and there was an error in the NIR. The ERT recommends that Iceland report the correct value of the MCF in the NIR. It also recommends that Iceland report the organic product in the required unit (i.e. kg biochemical oxygen demand (BOD)/1000 person/year instead of kg BOD/year) in CRF table 6.B.

74. The NIR does not fully transparently describe how sludge removal has been taken into account in the calculations of N_2O emissions and, in the case of sludge application to agricultural soils, in which sector and category the resulting emissions have been accounted. In response to questions raised by the ERT during the review, Iceland explained that as of 2011, sewage sludge has not been used as fertilizer, therefore emissions from sludge have been taken into account under solid waste disposal on land. Iceland further indicated in the NIR that one plant is in the process of attempting to use sewage sludge as fertilizer. The ERT recommends that Iceland increase the transparency of its reporting by including more background data on sludge removal (e.g. amount, N-content) in the NIR, indicating clearly in which category the resulting emissions are accounted.

75. Iceland has reassessed its protein consumption data following the recommendation made in the previous review report. In the 2013 annual submission, a constant value of 31.15 kg/capita/year is reported by the Party. However, protein supply data published by

FAOSTAT, the database of the Food and Agriculture Organization of the United Nations, for Iceland is significantly higher and shows some annual variations. For example, the latest data from FAOSTAT are for 2009 and correspond to 48.3 kg/capita/year. In response to questions raised by the ERT during the review, Iceland explained that protein supply data do not necessarily reflect real protein consumption, which is also acknowledged by the 2006 IPCC Guidelines by introducing a factor for non-consumed protein. Nevertheless, considering the relatively high discrepancy, the ERT strongly recommends that Iceland investigate this issue further, and report on any new results in the NIR.

Waste incineration – CO_2

76. Iceland has reported wood burned in bonfires on New Year's Eve under biogenic waste incineration. From table 8.10 of the NIR it is clear that other wastes with high biogenic carbon content are incinerated (e.g. paper, wood, diapers, food). As the corresponding CO_2 emissions are currently not reported, the ERT recommends that Iceland include the CO_2 emissions from all sources of biogenic carbon.

Other (waste) – CH_4 and N_2O

77. Although not required by the current UNFCCC reporting guidelines, Iceland has reported CH_4 and N_2O emissions from composting. In view of the growing amount of waste composted, the ERT considers it a commendable practice to report emissions from this category. However, the ERT noted that the NIR contains limited information on the amount of waste composted. According to chapter 8.5.2, the amount composted is estimated to be between 2,000 and 3,000 t/year until 2004. Since 2005, this amount has increased by approximately 2,000 t/year and was estimated at 15,000 tonnes in 2010. Annual numerical data are not provided, nor are data for 2011. The ERT therefore encourages Iceland to include the time series of the used AD in the NIR to increase transparency of its reporting.

G. Supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol

1. Information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Overview

78. Table 6 provides an overview of the information reported and parameters selected by Iceland under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 6
Supplementary information reported under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

	Findings and recommendations
Has Iceland reported information in accordance with the requirements in paragraphs 5–9 of the annex to decision 15/CMP.1?	Sufficient
Identify any elected activities under Article 3, paragraph 4, of the Kyoto Protocol	Activities elected: revegetation Years reported: 1990, 2008, 2009, 2010 and 2011
Identify the period of accounting	Commitment period accounting

		Findings and recommendations
Assessment of Iceland's ability to identify areas of land and areas of land-use change	Not sufficient	85

Activities under Article 3, paragraph 3, of the Kyoto Protocol

Afforestation and reforestation –CO_2

79. In table NIR-1, for 2011, below-ground biomass has been reported as "IE"; however, values have been reported in table 5(KP-1) A.1.1. Similarly, in table NIR-1 for 2011, Iceland reported dead wood as "IE", while "NO" has been reported in table 5(KP-1) A.1.1. In response to questions raised by the ERT during the review, Iceland indicated that the inconsistency was caused by an oversight during the submission of the KP-LULUCF tables: table NIR-1 was not updated. Therefore it contains information that is contradictory to information contained in KP-LULUCF table 5(KP-I) A.1.1. It should be indicated in table NIR-1 that below-ground biomass has been reported, and dead wood should be reported as "NO". Iceland indicated that it intends to correct this error in its next submission and the ERT recommends that Iceland correct this inconsistency.

80. During the review of the 2012 annual submission, in response to the potential problems and further questions raised by the ERT, Iceland provided additional information to support the fact that dead wood is currently not a source of net emissions, consistent with requirements in decision 15/CMP.1, and reported as "NO". According to the current NIR, these stocks will, in the future, be a source of carbon when decomposing. The plots will then be revisited and re-measured and assessed. The current ERT welcomes this additional information.

Deforestation – CO_2

81. In table NIR-1, for 2011, "NO" has been reported for all carbon pools. However, in table 5(KP-1) A.2, net CSC values have been reported for above-ground and below-ground biomass, litter and mineral soils. In response to questions raised by the ERT during the review, the Party noted that table NIR-1 was inadvertently not updated in the 2013 annual submission. Therefore it contains information that is contradictory to information contained in KP-LULUCF table 5(KP-I) A.2. Iceland indicated that it intends to correct this error for the 2014 annual submission. The ERT recommends that Iceland report these categories as "R" (reported) or "NO" as appropriate in KP-LULUCF table NIR-1.

82. In table NIR-1, for deforestation, lime application has been reported as "NO" but the notation key "NA" has been reported in table 5(KP-II) 4. In response to questions raised by the ERT during the review, Iceland indicated that this was due to the same error described in paragraphs 79 and 81 above. The ERT recommends that Iceland correct this error.

83. In table NIR-1, for deforestation, biomass burning has been reported as "NO" but the notation key "NA" has been reported in table 5(KP-II) 4. In response to questions raised by the ERT during the review, Iceland indicated that this was due to the same error described in paragraphs 79 and 81 above. The ERT recommends that Iceland improve consistency in the KP-LULUCF tables.

84. During the review of the 2012 annual submission, the ERT had identified that Iceland did not provide sufficient information to not report on CSC for the pools of deadwood, litter and soils. In response to the potential problems and further questions raised by the ERT during the review of the 2012 annual submission, Iceland provided estimates for litter and soils, and demonstrated that dead wood is not a net source of emissions. The previous review report recommended that Iceland provide this additional supporting information in the 2013 annual submission. This information was included in

the 2013 annual submission and the ERT welcomes the additional information provided by the Party.

Activities under Article 3, paragraph 4, of the Kyoto Protocol

Revegetation – CO_2

85. The 2012 NIR (page 248) suggests that Iceland is unable to specifically track land-use change in areas subject to revegetation, and therefore the previous review report recommended that Iceland implement a suitable tracking system for land subject to revegetation from 2008 onward, in order to meet the requirements set out in decision 15/CMP.1, annex, paragraph 6(b) and decision 16/CMP.1, annex, paragraph 20. No additional information has been provided in the 2013 annual submission. According to the NIR (page 244), "[l]osses in revegetation are not detected specifically. The losses are assumed to be reflected as changes in the carbon pool estimates of the National Inventory of Revegetation Activity (NIRA). Potential losses include losses in revegetated area, due to changes in land use. Losses in carbon pools through grazing, biomass burning and erosion are also recognized as potential These losses are expected to be detected in the NIRA, and will not be included until then". The ERT strongly reiterates the recommendation made in the previous review report that Iceland implement a suitable tracking system for land subject to revegetation.

2. Information on Kyoto Protocol units

Standard electronic format and reports from the national registry

86. No issuances or transactions of Kyoto Protocol units have occurred in the national registry of Iceland; therefore, information on the accounting of Kyoto Protocol units is not required to be reported in accordance with decision 15/CMP.1, annex, section I.E and decision 14/CMP.1 in the SEF tables. The standard independent assessment report (SIAR) was forwarded to the ERT prior to the review, pursuant to decision 16/CP.10. The ERT reiterated the main findings and recommendations contained in the SIAR (see paras. 89–91 below).

Calculation of the commitment period reserve

87. Iceland has reported its commitment period reserve in its 2013 annual submission. Iceland reported that its commitment period reserve has not changed since the initial report review (16,671,462 t CO_2 eq) as it is based on the assigned amount and not the most recently reviewed inventory. The ERT agrees with this figure.

3. Changes to the national system

88. Iceland reported that there is a change in its national system since the previous annual submission. Iceland reported in the NIR that in 2012 a new law on climate change (Act 70/2012) was adopted which formalizes the roles and responsibilities of EA and other institutions in the data collection process for the GHG inventory and the emission reporting. Other regulations under this Act are under preparation and will be in place for the next inventory submission. The ERT commends Iceland for the additional legal steps taken to implement and improve the national system. The ERT concluded that the Party's national system continues to be in accordance with the requirements of national systems outlined in decision 19/CMP.1.

4. Changes to the national registry

89. Iceland reported that there are changes in its national registry since the previous annual submission. In its NIR (page 252), the Party described the changes, specifically due to the centralization of the EU ETS operations into a single European Union (EU) registry operated by the European Commission called the Consolidated System of European Union Registries (CSEUR). CSEUR is a consolidated platform which implements the national registries in a consolidated manner and was developed together with the new EU registry.

90. The ERT noted that there were recommendations related to CSEUR in the SIAR that had not been addressed, in particular recommendations related to public availability of information on the website, reporting a description of the changes in database structure and reporting of test results. In response to questions raised by the ERT during the review, Iceland provided further information on the changes to the national registry, including on public availability of information on the website, reporting a description of the changes in database structure and reporting of test results.

91. The ERT concluded that, taking into account the confirmed changes in the national registry, including the additional information provided to the ERT during the review, Iceland's national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP). With respect to the provision of information specifically related to database structure, the ERT encourages the Party to provide additional information in the NIR. The ERT recommends that Iceland include all other additional information in response to the SIAR findings in its NIR in accordance with decision 15/CMP.1, annex, chapter I.G.

5. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol

92. Iceland reported that there are no changes in its reporting of the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol since the previous annual submission. The ERT concluded that the information provided continues to be complete and transparent.

93. Iceland provided a summary of its actions undertaken in accordance with Article 3, paragraph 14, of the Kyoto Protocol to minimize adverse impacts. These activities are:

(a) Taking into account feasibility, efficiency and national and international circumstances when planning economic instruments in Iceland to reduce GHG emissions;

(b) Not subsidizing the use of environmentally unsound and unsafe technologies;

(c) Cooperating with researchers in France and the United States of America to explore the feasibility of sequestering CO_2 in basaltic bedrock at the Hellisheiði geothermal plant;

(d) Supporting developing countries in the area of sustainable utilization of natural resources through its administration of the United Nations University Geothermal Training Programme.

III. Conclusions and recommendations

A. Conclusions

94. Table 7 summarizes the ERT's conclusions on the 2013 annual submission of Iceland, in accordance with the Article 8 review guidelines.

Table 7
Expert review team's conclusions on the 2013 annual submission of Iceland

		Paragraph cross-references
The ERT concludes that the inventory submission of Iceland is complete (categories, gases, years and geographical boundaries and contains both an NIR and CRF tables for 1990–2011)		
Annex A sources[a]	Complete	Table 3
LULUCF[a]	Not complete	Table 3, 62–65, 67
KP-LULUCF	Not complete	Table 3, 85
The ERT concludes that the inventory submission of Iceland has been prepared and reported in accordance with the UNFCCC reporting guidelines	Yes	
The submission of information required under Article 7, paragraph 1, of the Kyoto Protocol has been prepared and reported in accordance with decision 15/CMP.1	Yes	
Iceland's inventory is in accordance with the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* and the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*	Yes	Reiterated recommendations should be urgently implemented. 12, 20–21, 28
Iceland has reported information on Article 3 paragraphs 3 and 4, of the Kyoto Protocol	Yes	85
Iceland has reported information on its accounting of Kyoto Protocol units in accordance with decision 15/CMP.1, annex, chapter I.E, and used the required reporting format tables as specified by decision 14/CMP.1	Yes	
The national system continues to perform its required functions as set out in the annex to decision 19/CMP.1	Yes	12, 20
The national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant CMP decisions	Yes	
Information on single projects under decision 14/CP.7	Not sufficient	39

	Paragraph cross-references
Did Iceland provide information in the NIR on changes in its reporting of the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol?	Yes

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, CMP = Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, CRF = common reporting format, IPCC = Intergovernmental Panel on Climate Change, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NIR = national inventory report, UNFCCC reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories".

[a] The assessment of completeness by the ERT considers only the completeness of reporting of mandatory categories (i.e. categories for which methods and default emission factors are provided in the Intergovernmental Panel on Climate Change (IPCC) *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, or the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*).

B. Recommendations

95. The ERT identified the issues for improvement listed in table 8. All recommendations are for the next annual submission, unless otherwise specified

Table 8

Recommendations identified by the expert review team

Sector	*Category*	*Recommendation*	*Paragraph reference*
Cross-cutting	Recalculations and time series consistency	Provide CRF table 8(b)	Table 3
	Verification and quality assurance /quality control procedures	Enhance QC checks related to the consistency of information between the CRF tables and the NIR	Table 3
	Transparency	Review, and as appropriate, modify the notation keys used	Table 3
		Use the notation key "NO" for "other, please specify" categories, when it is assessed that emissions do not occur, and use the notation key "NE" when the categories occur, but have not been estimated (e.g. due to a lack of data or methodologies)	Table 3
	Inventory planning	Complete the formal procedures for the implementation of the regulation as soon as possible and implement the agreement with the National Energy Authority of Iceland (NEA) for the annual submission in 2014	12
	Uncertainty	Check the uncertainties in the agriculture and waste sectors against IPCC default uncertainty values and correct any errors and, as an additional QC check, compare uncertainties used with those of some other	Table 4

Sector	*Category*	*Recommendation*	*Paragraph reference*
		countries	
	Inventory management	Check whether key activity data (AD) or country-specific emission factors (EFs) or other country-specific parameters are without documentation and are still being used for the estimations of recent years. If such undocumented parameters are identified, search for the sources of those parameters and add these sources in the archiving system, or revisit the choice of parameters if no sources can be identified	15
Energy	Sector overview	Continue to make efforts to ensure that one organization has a full understanding of the complete energy balance and to ensure that the 2014 annual submission for the final year of the first commitment period is based on such an energy balance	20
		Provide more detailed information on the methodology for the modification of fuel consumption made by EA, based on the fuel sales data provided by NEA, and on the relationship between the data sets before and after the modification of fuel consumption	21
		Proceed with planned improvements, including preparation of a national energy balance, use of the COPERT model for road transportation and the application of a tier 2 methodology for civil aviation	22
	Comparison of the reference approach with the sectoral approach and international statistics	Correct the data for apparent energy consumption (excluding non-energy use and feedstocks) in CRF table 1.A(c) and evaluate the differences between the reference approach and the sectoral approach	24
		Use the notation key "NO" when a specific fuel type of activity (production, import, export, stock change) does not occur	26
	International bunker fuels	Improve the differentiation of fuel consumption for international and domestic aviation	27
		Improve the methodology for distinguishing between international and domestic navigation	28
	Feedstocks and non-energy use of fuels	Provide the rationale for the choice of carbon stored factors for coke oven coke, coking coal and electrodes	29
	Stationary combustion: liquid fuels – CO_2, CH_4 and N_2O	Review whether or not the net calorific value and carbon content of waste oil are appropriate for the national circumstances of Iceland, provide information on the result of the evaluation and, if use of the current EF cannot be justified, revise the EF or use the IPCC default value	30

Sector	*Category*	*Recommendation*	*Paragraph reference*
		Include a table on the CH_4 and N_2O EFs used, by each fuel type, the detailed reference for each EF and a rationale for the choice of EFs	31
	Road transportation – liquid fuels: CH_4 and N_2O	Continue to make efforts to apply COPERT to the calculation of GHG emissions from road transportation	32
	Oil and natural gas– CO_2 and CH_4	Include the methodology for estimating GHG emissions from this category	33
Industrial processes and solvent and other product use	Sector overview	Improve QC procedures in order to publish a consistent and accurate NIR and CRF tables	35
	Decision 14/CP.7	Use up-to-date references to estimate the emissions savings from electricity consumption for the projects to be reported under decision 14/CP.7	37
		Provide evidence that best available technology is used to minimize process CO_2 emissions and hence that the reporting on the single projects fulfils all the requirements of decision 14/CP.7	39
		Provide detailed tables with volumes and carbon contents for the ferrosilicon extension it desires to make subject to 14/CP.7	39
	Cement production – CO_2	Improve the transparency of the NIR by providing explanatory information on trends	40
	Aluminium production – CO_2 and PFCs	Improve the methodological description in the NIR	42
	Consumption of halocarbons and SF_6 – HFCs and SF_6	Continue to improve the methodology applied and ensure time-series consistency among the amount of substances and emissions categories (fillings, stocks, disposal)	43
		Ensure that the approach to estimating emissions and underlying assumptions are transparently described in the NIR	43
		Clarify in the NIR that there are no imports of HFCs for use as a foam blowing agent	45
		Further investigate and report on potential use of HFCs following the lifting of the ban on HFC import from 1 January 2013 onwards	45
		Ensure consistency and completeness by providing the available data that is described in the NIR in the relevant background CRF tables	46

Sector	*Category*	*Recommendation*	*Paragraph reference*
		Report potential emissions as "NE" as opposed to "NO" in the CRF tables	47
Agriculture	Enteric fermentation – CH_4	Document the assumptions behind the country-specific digestibility rate (DE) used, taking into account forage quality during grazing on scrubland and unfertilized grassland, which is common practice in Iceland, and forage quality during the stall period in winter	52
	Manure management–CH_4 and N_2O	Based on the results of the investigation to update the use of the currently used default DE value of 60.0 per cent for all cattle categories, evaluate whether a recalculation for the entire time series for CH_4 emissions from manure management is necessary	56
		Include more information in the NIR regarding the circumstances under which the country-specific nitrogen excretion data have been estimated	57
		Verify the animal weights used in the calculations	58
	Agricultural soils – N_2O	Analyse the data for cultivation of histosols and verify that negative emissions are not caused by the climate or other non-human induced factors; and if negative emissions are found to be climate related remove them from the averaging	59
		Include in the NIR a comparison of the country-specific EF for cultivation of histosols with peer-reviewed studies	59
LULUCF	Forest land remaining forest land – CO_2	Provide an additional description of, and/or references to, the scientific basis for the models or measurements used to estimate CSC, and a description of the process by which CSC and emissions or removals are estimated	62
		Use a higher-tier methodology to estimate CO_2 emissions from organic soils	63
		Report CSC in dead organic matter and mineral soils	63
	Land converted to forest land – CO_2	Develop a country-specific EF and AD for the estimation of CSC in organic soils	64
	Land converted to cropland – CO_2	Report CSC from conversion to cropland in a disaggregated manner	65
	Land converted to grassland – CO_2	Make efforts to develop estimates based on country-specific data (tier 2) and report on the improvements	66
	Grassland remaining grassland – CO_2	Report emissions from all areas of grassland, including degraded grassland	67
	Non-CO_2 emissions from drainage of soils and wetlands –	Justify the use of the current EF (0.60 kg N_2O-nitrogen/hectare) and differentiate the EF by soil type	68

Sector	*Category*	*Recommendation*	*Paragraph reference*
	N_2O		
Waste	Sector overview	Enhance QA/QC activities on the NIR	70
	Solid waste disposal on land – CH_4	Clearly provide documentation in the NIR to indicate to what extent CH_4 recovery data are based on measurements and to what extent they are based on estimates	72
		Include in the NIR more information on landfill gas utilization (e.g. energy content of recovered gas, place of utilization)	72
	Wastewater handling – CH_4 and N_2O	Report the correct value of the methane conversion factor (0.5) in the NIR	73
		Report the organic product in the required unit (i.e. kg biochemical oxygen demand (BOD)/1000 person/year instead of kg BOD/year) in CRF table 6.B	73
		Include more background data on sludge removal (e.g. amount, nitrogen content) in the NIR, indicating clearly in which category the resulting emissions are accounted	74
		Investigate differences in the protein consumption data reported by Iceland and that published by FAOSTAT, the database of the Food and Agriculture Organization of the United Nations	75
	Waste incineration – CO_2	Include the CO_2 emissions from all sources of biogenic carbon in reporting	76
KP-LULUCF	Afforestation and reforestation – CO_2	Correct the inconsistencies in the CRF tables, regarding the use of notation keys for below-ground biomass and dead wood	79
	Deforestation – CO_2	Report the categories above-ground and below-ground biomass, litter and mineral soils as "R" (reported) or "NO" as appropriate in KP-LULUCF table NIR-1	81
		Correct the inconsistent use of notation keys for deforestation, lime application in table NIR-1 and table 5(KP-II)	82
		Correct the inconsistent use of notation keys for deforestation, biomass burning in table NIR-1 and table 5(KP-II) 4	83
	Revegetation – CO_2	Implement a suitable tracking system for land subject to revegetation	85
National registry		Include in the NIR, in response to the findings of the standard independent assessment report, all additional information provided during the review	91

Abbreviations: AD = activity data, BOD = biochemical oxygen demand, CRF = common reporting format, CSC = carbon stock change, DE = digestibility rate, EA = Environment Agency of Iceland, EF= emission factor, GHG = greenhouse gas, IPCC = Intergovernmental Panel on Climate Change, kg = kilogram, NA = not applicable, NEA= National Energy Authority of Iceland, NE = not estimated, NIR = national inventory report, NO = not occurring, QA/QC = quality assurance/quality control.

IV. Questions of implementation

96. No questions of implementation were identified by the ERT during the review.

Annex I

Background data on recalculations and information to be included in the compilation and accounting database

Table 9
Recalculations in the 2013 annual submission for the base year and the most recent year

Greenhouse gas source and sink categories	*1990*	*2010*	*1990*	*2010*	*Reason for the recalculation*
	Value of recalculation (Gg CO_2 eq)		*Per cent change*		
1. Energy	0.41	2.86	0.0	0.2	Not provided in CRF table 8(b); according to NIR, changed AD
A. Fuel combustion (sectoral approach)		2.44		0.1	
1. Energy industries		2.28		49.5	
2. Manufacturing industries and construction		0.01		0.0	
3. Transport		0.00		0.0	
4. Other sectors		2.86		0.0	
5. Other					
B. Fugitive emissions from fuels	0.41	0.41	0.7	0.2	
1. Solid fuels					
2. Oil and natural gas	0.41	0.41	0.7	0.2	
2. Industrial processes	6.04	80.15	0.7	4.4	Not provided in CRF table 8(b); according to NIR, changed AD, EFs and methods
A. Mineral products		0.00		0.0	
B. Chemical industry					
C. Metal production	6.02	26.67	1.8	1.7	
D. Other production					
E. Production of halocarbons and SF_6					
F. Consumption of halocarbons and SF_6	0.02	53.48	2.1	72.3	
G. Other					
3. Solvent and other product use					
4. Agriculture	50.83	43.58	7.2	6.7	Not provided in CRF table 8(b); according to NIR, revisions due to transcription errors
A. Enteric fermentation	27.41	27.91	11.2	12.3	

Greenhouse gas source and sink categories	*1990*	*2010*	*1990*	*2010*	*Reason for the recalculation*
	Value of recalculation (Gg CO_2 eq)		*Per cent change*		
B. Manure management	20.10	19.00	65.9	64.2	
C. Rice cultivation					
D. Agricultural soils	3.33	–3.33	0.9	–1.0	
E. Prescribed burning of savannas					
F. Field burning of agricultural residues					
G. Other					
5. Land use, land-use change and forestry	–16.93	62.00	–1.4	8.5	Not provided in CRF table 8(b); according to NIR, due to changed AD and EFs
A. Forest land	–12.11	56.79	–38.1	21.0	
B. Cropland					
C. Grassland	–4.67	5.63	–9.3	3.3	
D. Wetlands					
E. Settlements		– 0.14		–64.5	
F. Other land					
G. Other		–0.27		–0.3	
6. Waste	–3.14	–3.72	–2.1	–1.7	Not provided in CRF table 8(b); according to NIR, due to changed AD
A. Solid waste disposal on land	–3.58	–1.35	–2.9	–0.7	
B. Wastewater handling	–0.14	–0.15	–1.8	–1.3	
C. Waste incineration	0.58	–2.21	3.3	–24.9	
D. Other					
7. Other					
Total CO_2 equivalent without LULUCF	54.14	122.86	1.5	2.7	
Total CO_2 equivalent with LULUCF	37.21	184.86	0.8	3.5	

Abbreviations: AD = activity data, CRF = common reporting format, EFs = emission factors, LULUCF = land use, land-use change and forestry, NIR = national inventory report.

Table 10
Information to be included in the compilation and accounting database in t CO_2 eq for 2011, including the commitment period reserve

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Commitment period reserve	16 671 462			16 671 462
Annex A emissions for 2011				
CO_2	3 332 750			3 332 750
CH_4	444 341	491 122		491 122
N_2O	448 453			448 453
HFCs	121 355			121 355
PFCs	63 219			63 219
SF_6	3 130			3 130
Total Annex A sources	**4 413 247**	**4 460 027**		**4 460 027**
Activities under Article 3, paragraph 3, for 2011				
3.3 Afforestation and reforestation on non-harvested land for 2011	–162 799			–162 799
3.3 Afforestation and reforestation on harvested land for 2011	NA			NA
3.3 Deforestation for 2011	456			456
Activities under Article 3, paragraph 4, for 2011[c]				
3.4 Forest management for 2011				
3.4 Cropland management for 2011				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2011				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2011	–523 446			–523 446
3.4 Revegetation in the base year	–349 120			–349 120

Abbreviation: NA = not applicable.
[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.
[c] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 11
Information to be included in the compilation and accounting database in t CO_2 eq for 2010

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2010				
CO_2	3 431 810			3 431 810
CH_4	459 467	506 371		506 371
N_2O	453 677			453 677
HFCs	122 536			122 536
PFCs	145 632			145 632
SF_6	4 889			4 889
Total Annex A sources	**4618 012**	**4 664 916**		**4 664 916**
Activities under Article 3, paragraph 3, for 2010				
3.3 Afforestation and reforestation on non-harvested land for 2010	–135 649			–135 649
3.3 Afforestation and reforestation on harvested land for 2010	NA			NA
3.3 Deforestation for 2010	80			80
Activities under Article 3, paragraph 4, for 2010[c]				
3.4 Forest management for 2010				
3.4 Cropland management for 2010				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2010				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2010	–515 981			–515 981
3.4 Revegetation in the base year	–349 120			–349 120

Abbreviation: NA = not applicable.
[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.
[c] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 12
Information to be included in the compilation and accounting database in t CO_2 eq for 2009

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2009				
CO_2	3 571 836			3 571 836
CH_4	458 850	506 564		506 564
N_2O	469 277			469 277
HFCs	95 015			95 015
PFCs	152 747			152 747
SF_6	3 171			3 171
Total Annex A sources	**4 750 895**	**4 798 609**		**4 798 609**
Activities under Article 3, paragraph 3, for 2009				
3.3 Afforestation and reforestation on non-harvested land for 2009	–115 642			–115 642
3.3 Afforestation and reforestation on harvested land for 2009	NA			NA
3.3 Deforestation for 2009	80			80
Activities under Article 3, paragraph 4, for 2009[c]				
3.4 Forest management for 2009				
3.4 Cropland management for 2009				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2009				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2009	–508 715			–508 715
3.4 Revegetation in the base year	–349 120			–349 120

Abbreviation: NA = not applicable.
[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.
[c] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 13
Information to be included in the compilation and accounting database in t CO_2 eq for 2008

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2008				
CO_2	3 605 128			3 605 128
CH_4	461 482	509 046		509 046
N_2O	504 194			504 194
HFCs	70 641			70 641
PFCs	348 998			348 998
SF_6	3 151			3 151
Total Annex A sources	**4 993 595**	**5 041 159**		**5 041 159**
Activities under Article 3, paragraph 3, for 2008				
3.3 Afforestation and reforestation on non-harvested land for 2008	−103 243			−103 243
3.3 Afforestation and reforestation on harvested land for 2008	NA			NA
3.3 Deforestation for 2008	80			80
Activities under Article 3, paragraph 4, for 2008[c]				
3.4 Forest management for 2008				
3.4 Cropland management for 2008				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2008				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2008	−501 532			−501 532
3.4 Revegetation in the base year	−349 120			−349 120

Abbreviation: NA = not applicable.
[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.
[c] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Annex II

Documents and information used during the review

A. Reference documents

Intergovernmental Panel on Climate Change. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>.

Intergovernmental Panel on Climate Change. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm>.

Intergovernmental Panel on Climate Change. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/gp/english/>.

Intergovernmental Panel on Climate Change. *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. Available at <http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.htm>.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories". FCCC/SBSTA/2006/9. Available at <http://unfccc.int/resource/docs/2006/sbsta/eng/09.pdf>.

"Guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention". FCCC/CP/2002/8. Available at <http://unfccc.int/resource/docs/cop8/08.pdf>.

"Guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol". Decision 19/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=14>.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

"Guidelines for review under Article 8 of the Kyoto Protocol". Decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

Status report for Iceland 2013. Available at <http://unfccc.int/resource/docs/2013/asr/isl.pdf>.

Synthesis and assessment report on the greenhouse gas inventories submitted in 2013. Available at <http://unfccc.int/resource/webdocs/sai/2013.pdf>.

FCCC/ARR/2012/ISL. Report of the individual review of the annual submission of Iceland submitted in 2012. Available at <http://unfccc.int/resource/docs/2013/arr/isl.pdf>.

UNFCCC. *Standard Independent Assessment Report*, parts I and II. Available at <http://unfccc.int/kyoto_protocol/registry_systems/independent_assessment_reports/items/4061.php>.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Christoph Wöll (Environment Agency of Iceland), including additional material on the methodology and assumptions used. The following documents[1] were also provided by Iceland:

Guðmundsson, J., 2009, *Losun hláturgass og annarra gróðurhúsalofttegunda úr lífrænum* (Greenhouse gases and other emissions from organic soils with different land use)

jarðvegi við mismunandi landnotkun (Soils with different land uses). Final report.

Svanhildur Ósk Ketilsdóttir og Þóroddur Sveinsson , 2010a, Efnainnihald kúamykju og mælingar in situ á þurrefni (Nutrition and measurements in situ), NH4-N og P með Agros Nova mælibúnað i Landbúnaðarháskóli Íslands, 207-215.

Svanhildur Ósk Ketilsdóttir og Þóroddur Sveinsson, 2010b, Gashæfni kúamykju og möguleikar metanvinnslu (Potential Methane Production) í Eyjafirði, Landbúnaðarháskóli Íslands, pp18-26.

[1] Reproduced as received from the Party.

Annex III

Acronyms and abbreviations

AD	activity data
BAT	best available technology
BOD	biochemical oxygen demand
BREF	Best Available Techniques reference document for the non-ferrous metal industries
CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CRF	common reporting format
CSC	carbon stock change
CSEUR	Consolidated System of European Union Registries
DE	digestibility rate
DOM	dead organic matter
EF	emission factor
ERT	expert review team
EU	European Union
EU ETS	European Union Emissions Trading System
FAOSTAT	database of the Food and Agriculture Organization of the United Nations
F-gases	fluorinated gases
GE	gross energy
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 without GHG emissions and removals from LULUCF
ha	hectare
HFCs	hydrofluorocarbons
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
ITL	international transaction log
kg	kilogram (1 kg = 1,000 grams)
KP-LULUCF	land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
kWh	kilowatt hour
LULUCF	land use, land-use change and forestry
m^3	cubic metre
MCF	methane correction factor
Mg	megagram (1 Mg = 1 tonne)
N	nitrogen
N_2O	nitrous oxide
NA	not applicable
NCV	net calorific value
NE	not estimated
Nex	nitrogen excretion rate
NIR	national inventory report
NO	not occurring
PFCs	perfluorocarbons
PJ	petajoule (1 PJ = 10^{15} joule)
QA/QC	quality assurance/quality control

SEF	standard electronic format
SF_6	sulphur hexafluoride
SIAR	standard independent assessment report
SO_2	sulphur dioxide
TJ	terajoule (1 TJ = 10^{12} joule)
UNFCCC	United Nations Framework Convention on Climate Change
VS	volatile solids